

We Claim:

1. A method for producing a phase shifter mask used for 157 nm lithography, the method which comprises, producing and/or processing a coating of an organic material on the phase shifter mask using an electron beam.

2. The method according to claim 1, which comprises:

configuring the phase shifter mask in a space with at least one gaseous organic compound and depositing a coating of the organic compound onto the phase shifter mask to thereby obtain the coating of the organic material on the phase shifter mask; and

performing the step of processing the coating of the organic material, which is the coating of the organic compound, by pointing the electron beam at the coating of the organic compound to decompose the coating of the organic compound and initiate diffusion of organic compounds from non-irradiated areas of the coating of the organic compound.

3. The method according to claim 1, which comprises subsequently hardening the coating of the organic material using an electron beam.

4. The method according to claim 1, wherein the coating of the organic material is configured on the phase shifter mask for repairing defects in a half-tone layer of the phase shifter mask.
5. The method according to claim 1, which comprises, after obtaining a decomposition product from the coating of the organic material, performing a UV cleaning of the phase shifter mask.
6. An apparatus for producing a phase shifter mask for 157 nm lithography, the apparatus comprising a device for emitting at least one electron beam for performing at least one step selected from a group consisting of producing a coating on the phase shifter mask and processing a coating that has at least partially been configured on the phase shifter mask.
7. The apparatus according to claim 6, wherein said device for emitting at least one electron beam is designed to deposit at least one organic coating on the phase shifter mask.
8. The apparatus according to claim 6, wherein said device for emitting at least one electron beam is controllable based on at least one scan selected from a group consisting of a row scan and a column scan.

9. The apparatus according to claim 6, wherein, for hardening the coating that has at least partially been configured on the phase shifter mask, said device for emitting at least one electron beam is controllable based on at least one scan selected from a group consisting of a row scan and a column scan.

10. The apparatus according to claim 6, wherein, for hardening the coating that has been produced on the phase shifter mask, said device for emitting at least one electron beam is controllable based on at least one scan selected from a group consisting of a row scan and a column scan.